

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
10 February 2005 (10.02.2005)

PCT

(10) International Publication Number  
**WO 2005/012180 A3**

(51) International Patent Classification:

C02F 1/44 (2006.01) C02F 1/32 (2006.01)  
B01D 61/02 (2006.01) C02F 103/08 (2006.01)  
B63J 1/00 (2006.01)

(21) International Application Number:

PCT/SG2004/000232

(22) International Filing Date: 2 August 2004 (02.08.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

200304231-4 2 August 2003 (02.08.2003) SG

(71) Applicant and

(72) Inventor: GUEH, How Kiap [SG/SG]; Blk 347, Clementi Ave. 5, #05-66, Singapore 120347 (SG).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,

GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(88) Date of publication of the international search report:

20 July 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND APPARATUS FOR HULL INTEGRATED SEAWATER REVERSE OSMOSIS SYSTEM

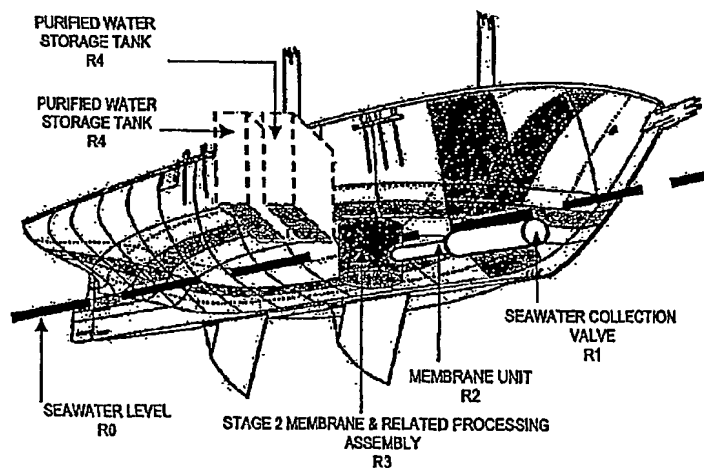


Figure 2 illustrates a perspective diagram of a sea vessel with a valve combined with additional filters and at least 1 membrane to filter seawater incoming via the said valve to yield seawater with a reduced amount of impurities, such as sodium chloride.

(57) Abstract: The present invention relates to a method and apparatus for having a integrated fluid media filtration and membrane unit within the hull of a sea-bound vessel. The vessel's propulsion will drive the flow of seawater into the media filtration and membrane unit. Multiple stages of the passing of seawater via the membrane and/or a series of progressive membranes can be implemented to reduce the level of sodium chloride present in seawater to desirable specifications.

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/SG2004/000232

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. C02F1/44 B01D61/02 B63J1/00 ADD. C02F1/32 C02F103/08		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) B01D C02F B63J		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data, PAJ		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 256 377 A (* INTERSEA RESEARCH AND DEVELOPMENT LIMITED) 9 December 1992 (1992-12-09) the whole document	1-31
X	US 2002/189987 A1 (WAGNER PATRICK) 19 December 2002 (2002-12-19) the whole document	1-31
X	LAMPE H ET AL: "PCS - Preussag Conversion System@? Mobile floating seawater desalination plant" DESALINATION, ELSEVIER, AMSTERDAM, NL, vol. 114, no. 2, 15 December 1997 (1997-12-15), pages 145-151, XP004108628 ISSN: 0011-9164 the whole document	1-31
-/-		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents : *A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art *Z* document member of the same patent family		
Date of the actual completion of the international search 18 April 2006		Date of mailing of the international search report 26/04/2006
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016		Authorized officer Liebig, T

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/SG2004/000232

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	WO 2004/033373 A (WATER STANDARD COMPANY, LLC; GORDON, ANDREW, W; CUSHING, CHARLES, R; D) 22 April 2004 (2004-04-22) the whole document	1-31
A	ES 2 165 824 A1 (DYTA, ENERGIA Y MEDIO AMBIENTE, S.A.L.) 16 March 2002 (2002-03-16) the whole document	1-31
A	US 4 452 696 A (LOPEZ ET AL) 5 June 1984 (1984-06-05) the whole document	1-31

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/SG2004/000232

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2256377	A	09-12-1992	NONE
US 2002189987	A1	19-12-2002	AT 234758 T 15-04-2003 AU 765325 B2 18-09-2003 AU 2687201 A 03-07-2001 DE 60001759 D1 24-04-2003 DE 60001759 T2 18-12-2003 DK 1240076 T3 14-07-2003 EP 1240076 A1 18-09-2002 ES 2193995 T3 16-11-2003 WO 0146007 A1 28-06-2001 FR 2802508 A1 22-06-2001 NZ 519728 A 29-10-2004 PT 1240076 T 29-08-2003
WO 2004033373	A	22-04-2004	AU 2003268197 A1 04-05-2004 BR 0314569 A 30-08-2005 CA 2501414 A1 22-04-2004 EP 1551769 A2 13-07-2005 JP 2006502049 T 19-01-2006
ES 2165824	A1	16-03-2002	NONE
US 4452696	A	05-06-1984	AU 549368 B2 23-01-1986 AU 8240182 A 14-10-1982 DE 3264231 D1 25-07-1985 EP 0062944 A1 20-10-1982 ES 8301842 A1 01-04-1983 FR 2503129 A1 08-10-1982 GR 76090 A1 03-08-1984 IL 65421 A 31-12-1985 JP 1648450 C 13-03-1992 JP 3009799 B 12-02-1991 JP 57177387 A 01-11-1982